

Serial No. 09/819,952  
Docket No. F00-242-US

2

**AMENDMENTS TO THE CLAIMS:**

1. (Currently amended) A light-emitting semiconductor device comprising:
  - a substrate;
  - a plurality of semiconductor layers which comprise group III nitride group compound semiconductor and are laminated on said substrate by crystal growth;
  - an emission layer formed on a first side of the substrate; and
  - a mirror surface formed on a second side of the substrate opposite the first side, said mirror surface comprising:
    - a light transmission layer which directly contacts said substrate, has luminous transparency, and comprises at least one material selected from a group consisting of metal oxides and ceramics; and
    - a reflection layer which is formed on said light transmission layer, comprises a metal, and reflects lights emitted from said emission layer; and
    - ~~a corrosion-resistant layer which comprises at least one of a metal oxide and a ceramic,~~
  - wherein said second side of said substrate comprises split lines for dividing said substrate into chips, and
  - wherein said light transmission layer comprises a thickness of at least 5 nm.
- 2-3. (Canceled)
4. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 1, wherein the reflective layer is formed by using at least one metal from a group consisting of aluminum (Al), silver (Ag), and their alloys.
5. (Canceled)
6. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 1, wherein the thickness of the reflective layer is in a range of 5nm to 20 $\mu$ m.

Serial No. 09/819,952  
Docket No. F00-242-US

3

7. (Canceled)
8. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 1, wherein said light transmission layer comprises at least one material selected from a group of metal oxides and oxides consisting of  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{MgO}$ ,  $\text{MgCO}_3$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{ZnO}$ ,  $\text{In}_2\text{O}_3$ ,  $\text{SiO}_2$ ,  $\text{SnO}_2$ , and  $\text{ZrO}_2$ .
9. (Canceled)
10. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 4, wherein said light transmission layer comprises at least one material selected from a group of metal oxides and oxides consisting of  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{MgO}$ ,  $\text{MgCO}_3$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{ZnO}$ ,  $\text{In}_2\text{O}_3$ ,  $\text{SiO}_2$ ,  $\text{SnO}_2$ , and  $\text{ZrO}_2$ .
11. (Canceled)
12. (Previously presented) A light-emitting device using a group III nitride group compound semiconductor according to claim 6, wherein said light transmission layer comprises at least one material selected from a group of metal oxides and oxides consisting of  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{MgO}$ ,  $\text{MgCO}_3$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{ZnO}$ ,  $\text{In}_2\text{O}_3$ ,  $\text{SiO}_2$ ,  $\text{SnO}_2$ , and  $\text{ZrO}_2$ .
13. (Canceled)
14. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 1, wherein a thickness of the light transmission layer is in a range of about 5nm to 10 $\mu\text{m}$ .
15. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 8, wherein a thickness of the light transmission layer is in a range of about 5nm to 10 $\mu\text{m}$ .

Serial No. 09/819,952  
Docket No. F00-242-US

4

16. (Canceled)
17. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 10, wherein a thickness of the light transmission layer is in a range of about 5nm to 10 $\mu$ m.
18. (Canceled)
19. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 12, wherein a thickness of the light transmission layer is in a range of about 5nm to 10 $\mu$ m.
- 20-23. (Canceled)
24. (Original) A light-emitting device using a group III nitride compound semiconductor according to claim 1, wherein the substrate comprises sapphire and has a thickness in a range of about 75 $\mu$ m to 150 $\mu$ m.
25. (Canceled)
26. (Previously presented) A light-emitting device using a group III nitride compound semiconductor according to claim 1, wherein the reflective layer comprises at least one metal selected from a group consisting of rhodium (Rh), ruthenium (Ru), platinum (Pt), gold (Au), copper (Cu), palladium (Pd), chromium (Cr), nickel (Ni), cobalt (Co), titanium (Ti), indium (In), molybdenum (Mo), and their alloys.
27. (Canceled)
28. (Original) A light-emitting device using a group III nitride group compound semiconductor according to claim 8, wherein the reflective layer comprises at least one metal selected from a group consisting of rhodium (Rh), ruthenium (Ru), platinum (Pt), gold (Au),

Serial No. 09/819,952  
Docket No. F00-242-US

5

copper (Cu), palladium (Pd), chromium (Cr), nickel (Ni), cobalt (Co), titanium (Ti), indium (In), molybdenum (Mo), and their alloys.

29. (Canceled)
30. (Previously presented) A light-emitting device using a group III nitride compound semiconductor according to claim 1, wherein the reflective layer comprises a multi-layer structure comprising a plurality of metal layers.
- 31-37. (Canceled)
38. (Previously presented) A light-emitting device according to claim 1, wherein said mirror surface is formed on said split lines.
39. (Previously presented) A light-emitting device according to claim 1, wherein said substrate has a thickness in a range between 80 $\mu$ m to 100 $\mu$ m.
40. (Previously presented) A light-emitting device according to claim 1, wherein separation grooves are formed in said first side of said substrate, said split lines being formed opposite and along said separation grooves.
41. (Previously presented) A light-emitting device according to claim 40, wherein said separation grooves in said first side of said substrate have a depth in a range between 6 $\mu$ m and 15  $\mu$ m, and are visible through said substrate when viewing said second side of said substrate.
42. (Previously presented) A light-emitting device according to claim 1, wherein said split lines comprise a grid-like pattern on said second side of said substrate.
43. (Previously presented) A light-emitting device according to claim 1, further comprising:

Serial No. 09/819,952  
Docket No. F00-242-US

6

an adhesive sheet formed on said first side of said substrate, said light transmission layer being formed on at least a portion of said adhesive sheet, to inhibit a volatilization of adhesive materials in said adhesive sheet.

44. (Currently amended) A structure for forming a plurality of light-emitting semiconductor devices comprising:

a plurality of semiconductor layers comprising group III nitride group compound semiconductor which are formed on a first side of said substrate;

an emission layer formed on said first side of the substrate; and

a mirror surface formed on a second side of the substrate opposite the first side, said mirror surface comprising:

a light transmission layer which contacts said substrate, has luminous transparency, and comprises at least one material selected from a group consisting of metal oxides and ceramics; and

a reflection layer which is formed on said light transmission layer, comprises a metal, and reflects lights emitted from said emission layer; and

~~a corrosion-resistant layer which comprises at least one of a metal oxide and a ceramic,~~

wherein said second side of said substrate comprises split lines for dividing said substrate into said plurality of light-emitting devices, and

wherein said light transmission layer comprises a thickness of at least 5 nm.

45. (Currently amended) A light-emitting device using a group III nitride group compound semiconductor according to claim 1, wherein said light transmission layer comprises a thickness in a range from 10 nm to 500 nm ~~the corrosion-resistant layer comprises at least one material selected from a group consisting of  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{MgO}$ ,  $\text{MgCO}_3$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{ZnO}$ ,  $\text{In}_2\text{O}_3$ ,  $\text{SiO}_2$ ,  $\text{ZrO}_2$ , metal carbides, metal nitrides, and metal borides.~~

46. (Currently amended) A light-emitting device using a group III nitride group compound semiconductor according to claim 1, wherein said light transmission layer comprises a thickness in a range from 20 nm to 300 nm ~~a thickness of the corrosion-resistant~~

Serial No. 09/819,952  
Docket No. F00-242-US

7

~~layer is in a range of about 5nm to 10 $\mu$ m.~~

47. (Currently amended) A light-emitting device using a group III nitride group compound semiconductor according to claim 1, wherein said second side of said substrate comprises a polished surface ~~said corrosion-resistant layer is formed on said reflection layer.~~

48. (New) A light-emitting semiconductor device according to claim 1, wherein said first side of said substrate comprises separation grooves at a position which corresponds to said split lines, and having a depth of 1/30 to 1/2 of a thickness of said substrate